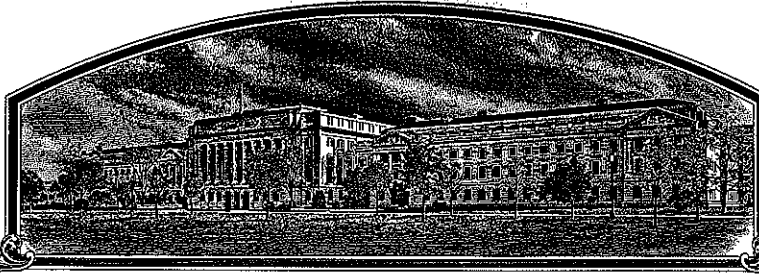


No.

200400066



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Sungenta Seeds, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR PROPAGATING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN, FIELD

'NP2391'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twenty-ninth day of April, in the year two thousand and eight.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

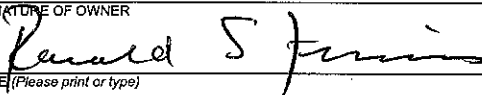
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

| 1. NAME OF OWNER Syngenta Seeds, Inc. | | 2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME _____ | | 3. VARIETY NAME NP2391 | | | | | | | | | | | |
|---|-------------------------------------|---|--|--|--|--|-------------------------------------|--------------------|---------------------|---------------------------|--|--------------------|--|---------------------|--|
| 4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) P.O. Box 959 Minneapolis, MN 55440 | | 5. TELEPHONE (include area code) (763) 593-7333 6. FAX (include area code) (763) 593-7828 | | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th align="center" colspan="2">FOR OFFICIAL USE ONLY</th> </tr> <tr> <td colspan="2">PVPO NUMBER</td> </tr> <tr> <td align="center" colspan="2" style="font-size: 24pt;">200400066</td> </tr> <tr> <td colspan="2">FILING DATE</td> </tr> <tr> <td align="center" colspan="2" style="font-size: 18pt;">January 21, 2004</td> </tr> </table> | | FOR OFFICIAL USE ONLY | | PVPO NUMBER | | 200400066 | | FILING DATE | | January 21, 2004 | |
| FOR OFFICIAL USE ONLY | | | | | | | | | | | | | | | |
| PVPO NUMBER | | | | | | | | | | | | | | | |
| 200400066 | | | | | | | | | | | | | | | |
| FILING DATE | | | | | | | | | | | | | | | |
| January 21, 2004 | | | | | | | | | | | | | | | |
| 7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corporation | | 8. IF INCORPORATED, GIVE STATE OF INCORPORATION DE | | 9. DATE OF INCORPORATION September 24, 1976 | | | | | | | | | | | |
| 10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Ms. Dana S. Rewoldt Syngenta Seeds Inc. 2369 330th Street, P.O. Box 500 Slater IA 50244 | | | | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="4" style="width: 10%; text-align: center; vertical-align: middle;">F E E S R E C E I V E D</td> <td>FILING AND EXAMINATION FEES:</td> </tr> <tr> <td>\$ 3652.00</td> </tr> <tr> <td>DATE 1/21/04</td> </tr> <tr> <td>CERTIFICATION FEE:</td> </tr> <tr> <td></td> <td>\$ 768.00</td> </tr> <tr> <td></td> <td>DATE 3/11/08</td> </tr> </table> | | F E E S R E C E I V E D | FILING AND EXAMINATION FEES: | \$ 3652.00 | DATE 1/21/04 | CERTIFICATION FEE: | | \$ 768.00 | | DATE 3/11/08 | |
| F E E S R E C E I V E D | FILING AND EXAMINATION FEES: | | | | | | | | | | | | | | |
| | \$ 3652.00 | | | | | | | | | | | | | | |
| | DATE 1/21/04 | | | | | | | | | | | | | | |
| | CERTIFICATION FEE: | | | | | | | | | | | | | | |
| | \$ 768.00 | | | | | | | | | | | | | | |
| | DATE 3/11/08 | | | | | | | | | | | | | | |
| 11. TELEPHONE (Include area code) 515-685-5201 | | 12. FAX (Include area code) 515-865-5072 | | 13. E-MAIL dana.rewoldt@syngenta.com | | | | | | | | | | | |
| 14. CROP KIND (Common Name) Corn (dent) | | 16. FAMILY NAME (Botanical) Gramineae | | 18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION. _____ | | | | | | | | | | | |
| 15. GENUS AND SPECIES NAME OF CROP Zea mays L. | | 17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | 20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input checked="" type="checkbox"/> NO (If "no", go to item 23) | | | | | | | | | | | |
| 19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$3,652), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office) | | | | 21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED 22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED <i>(If additional explanation is necessary, please use the space indicated on the reverse.)</i> | | | | | | | | | | | |
| 23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. <i>(Please use space indicated on reverse.)</i> | | | | 24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. <i>(Please use space indicated on reverse.)</i> | | | | | | | | | | | |
| 25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties. | | | | | | | | | | | | | | | |
| SIGNATURE OF OWNER  NAME (Please print or type) Ronald S. Ferriss, Ph.D. | | | SIGNATURE OF OWNER _____ NAME (Please print or type) Ronald S. Ferriss, Ph.D. | | | | | | | | | | | | |
| CAPACITY OR TITLE Director, Strategy Facilitation | | DATE 01/19/2004 | | CAPACITY OR TITLE Director, Strategy Facilitation | | | | | | | | | | | |
| DATE 01/19/2004 | | DATE 01/19/2004 | | DATE 01/19/2004 | | | | | | | | | | | |

(See reverse for instructions and information collection burden statement)

INSTRUCTIONS

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to **reproduce** the variety, or for tuber reproduced varieties verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvp.htm>

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

Released in a hybrid, 1-22-2003, offered for sale in the U.S.A. and Canada

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NP993 has been issued a PVP Certificate in the U.S.A., 1998, #9600118, and a Patent in the U.S.A., 1998, #5, 817,914

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Syngenta Seeds, Inc.
NP2391
Exhibit A

Origin and Breeding History of Corn Inbred Line NP2391

The corn inbred NP2391 was derived from the initial cross of inbred line 993 and inbred line 982. Inbred lines 993 (P.V.P. Certificate, 1998, #9600118) and 982 were developed and are owned by Syngenta Seeds, Inc. Inbred line 993 was derived by self-pollination in the F₁ hybrid Pioneer Brand 3737. Inbred line 982 was developed from the cross of Syngenta inbred line 761 and the line LH123 owned by Holden's Foundation Seeds. After the initial cross of the F₁ of 993 and 982 was made, the breeding method was simple pedigree ear-to-row for the development of inbred line NP2391.

The initial self-pollination of the F₁ source was made at Kekaha, Kauai, HI in the Northrup King nursery during the winter of 1993-94. This was followed by self-pollinating and pedigree selection alternating between Janesville, WI and Kekaha, Kauai from 1994 through 1999.

The chronology of inbreeding is given below:

| | |
|---------------------|--|
| 1993 Stanton, MN | F ₁ of inbred line 993 with inbred line 982 produced. |
| 1993 Kauai, HI | F ₁ self-pollinated to produce F ₂ . |
| 1994 Janesville, WI | F ₂ self-pollinated to produce F ₃ ears. |
| 1995 Janesville, WI | Observed F ₃ ear rows. |
| 1995 Kauai, HI | Selected F ₃ ear rows self-pollinated to produce F ₄ ears. |
| 1996 Janesville, WI | Selected F ₄ ear rows self-pollinated to produce F ₅ ears. |
| 1996 Kauai, HI | Selected F ₅ ear rows self-pollinated to produce F ₆ ears. |
| 1997 Janesville, WI | Selected F ₆ ear rows self-pollinated to produce F ₇ ears. |
| 1997 Kauai, HI | Selected F ₇ ear rows self-pollinated to produce F ₈ ears. |
| 1998 Janesville, WI | Selected F ₈ ear rows self-pollinated to produce F ₉ ears. |
| 1998 Kauai, HI | Selected F ₉ ear rows self-pollinated to produce F ₁₀ ears. |
| 1999 Janesville, WI | Selected F ₁₀ ear rows self-pollinated to produce F ₁₁ ears. |
| 1999 Kauai, HI | Selected F ₁₁ ear rows self-pollinated to produce F ₁₂ ears. |
| 2000 Stanton, MN | Selected F ₁₂ ear rows bulk self-pollinated to produce Breeder Seed. |

Selection criteria used during the inbreeding process included synchronous male and female flowering, plant health, ear fill, pre-harvest intactness and resistance to various stalk rots. Plants within each generation are also closely evaluated for uniformity of anther and silk color and plant and ear height. Selection was also done on specific combining ability for yield in hybrid combinations with several inbreds.

Syngenta Seeds, Inc.
NP2391
Exhibit A (continued)

From 2000 to the present, the inbred line has been observed in Rochelle, IL, Stanton, MN, Janesville, WI and other locations. No phenotypic or isozymic variants have been observed. NP2391 is a uniform and stable inbred (from 2000 to 2003 during at least 5 generations of propagation).

200400066

Syngenta Seeds, Inc.
NP2391
Exhibit B

Distinctness of Corn Inbred Line NP2391

The corn inbred line NP2391 (seed source 2321170) is most similar to the PVP Standard Inbred Line A619 (seed source DY990012). Comparisons of the two varieties were conducted in "side-by-side" trials in 2002 in Stanton, MN (2 plantings) and Janesville, WI (2 plantings) and trials in 2003 in Stanton, MN (2 plantings), Janesville, WI (2 plantings) and London Ont., Canada (1 planting). The trials were planted with two replications at each site. Plot size included 2 rows for each variety and measured 152 cm x 518 cm. Each plot had approximately 70 plants.

For plant level traits, we sampled 5 representative plants from the 2 rows of the 2 row plot at each location/environment and calculated an average for the plot. For plot level traits we evaluated the 2 row plot and gave an average score for the plot within that location/environment.

The traits collectively show measurable differences between the two varieties.

NP2391 differs from A619 for several different traits. These traits are:

The NP2391 leaf color is darker than the A619 leaf. The NP2391 leaf is a dark green (03 or 5GY 3/4) vs. A619 leaf is medium green (02 or 5GY 4/4).

The cob color of NP2391 is red (14 or 5R 4/6) vs. A619 is white (19 or 2.5Y 8/2).

NP2391 is a distinct and unique inbred line.

OBJECTIVE DESCRIPTION OF VARIETY

| | | | | | |
|--|---|---|---------------------------|---|--|
| Name of Applicant(s) Syngenta Seeds, Inc. | | Variety Seed Source 2321170 | | Variety Name or Temporary Designation NP2391 | |
| Address (Street & No., or R.F.D. No., City, State, Zip Code and Country) P.O. Box 959, Minneapolis, MN 55440 USA | | | | FOR OFFICIAL USE | |
| | | | | PVPO Number 200400066 | |
| Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a '*' are considered necessary for an adequate variety description and must be completed. | | | | | |
| COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices: describe #25 and #26 in comment section): | | | | | |
| 01=Light Green | 06=Pale Yellow | 11=Pink | 16=Pale Purple | 21=Buff | |
| 02=Medium Green | 07=Yellow | 12=Light Red | 17=Purple | 22=Tan | |
| 03=Dark Green | 08=Yellow-Orange | 13=Cherry Red | 18=Colorless | 23=Brown | |
| 04=Very Dark Green | 09=Salmon | 14=Red | 19=White | 24=Bronze | |
| 05=Green-Yellow | 10=Pink-Orange | 15=Red & White | 20=White Capped | 25=Variegated (Describe) | |
| | | | | 26=Other (Describe) | |
| STANDARD INBRED CHOICES (Use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data): | | | | | |
| Yellow Dent Families: | | Yellow Dent (Unrelated): | | Sweet Corn: | |
| Family | Members | | | C13, Iowa5125, P39, 2132 | |
| B14 | CM105, A632, B64, B68 | Co109, ND246, | | | |
| B37 | B37, B76, H84 | Oh7, T232 | | | |
| B73 | N192, A679, B73, NC268 | W117, W153R | | Popcorn: | |
| C103 | Mo17, Va102, Va35, A682 | W182BN | | SG1533, 4722, HP301, HP7211 | |
| Oh43 | A619, MS71, H99, Va26 | White Dent: | | Pipcorn: | |
| WF9 | W64A, A554, A654, Pa91 | CI66, H105, Ky228 | | Mo15W, Mo16W, Mo24W | |
| 1. TYPE: (describe intermediate types in Comments section) | | | | Standard Inbred Name A619 | |
| 2 1=Sweet 2=Dent 3=Flint 4=Flour 5=Pop 6=Ornamental 7=Pipcorn | | | | | |
| 2. REGION WHERE DEVELOPED IN THE U.S.A.: | | | | Standard Seed Source DY990012 | |
| 2 1=Northwest 2=Northcentral 3=Northeast 4=Southeast 5=Southcentral 6=Southwest 7=Other | | | | | |
| 3. MATURITY (In Region Best Adaptability; show Heat Unit formula in "Comments" section): | | | | | |
| DAYS HEAT UNITS | | | DAYS HEAT UNITS | | |
| 74 | 1333.2 | From emergence to 50% of plants in silk | 71 | 1261.8 | |
| 74 | 1320.2 | From emergence to 50% of plants in pollen | 69 | 1232.8 | |
| 003 | 90.3 | From 10% to 90% pollen shed | 004 | 101.4 | |
| NA | NA | From 50% silk to optimum edible quality | NA | NA | |
| NA | NA | From 50% silk to harvest at 25% moisture | NA | NA | |
| 4. PLANT: | | | | | |
| | | Standard Deviation | Sample Size | | |
| 182.8 | cm Plant Height (to tassel tip) | 16.0 | 45 | 190.9 | Standard Deviation 13.5 Sample Size 45 |
| 48.8 | cm Ear Height (to base of top ear node) | 9.9 | 45 | 46.9 | 2.1 45 |
| 11.9 | cm Length of Top Ear Internode | 1.4 | 45 | 13.8 | 0.8 45 |
| 0.1 | Average Number of Tillers | 0.2 | 45 | 0.1 | 0.2 45 |
| 1.5 | Average Number of Ears per Stalk | 0.1 | 45 | 1.0 | 0.0 45 |
| 2 Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate 4=Dark | | | 2 | | |
| Application Variety Data NP2391 | | | Page 1 | | |
| | | | Standard Inbred Data A619 | | |

200400066

| Applicant Variety Data NP2391 | | | Page 2 | Standard Inbred Data A619 | | |
|---|--------------------|-------------|--------|------------------------------|-------------|--|
| 5. LEAF: | Standard Deviation | Sample Size | | Standard Deviation | Sample Size | |
| 009.4 cm Width of Ear Node Leaf | 0.6 | 45 | | 009.1 0.4 | 45 | |
| 073.3 cm Length of Ear Node Leaf | 4.9 | 45 | | 071.6 7.4 | 45 | |
| 007 Number of leaves above top ear | 0.2 | 45 | | 005 0.2 | 45 | |
| 038 degrees Leaf Angle (measure from 2 nd leaf above ear at anthesis to stalk above leaf) | 23.1 | 45 | | 040 18.0 | 45 | |
| 03 Leaf Color (Munsell code 5GY 3/4) | | | | 02 (Munsell code 5GY 4/4) | | |
| 2 Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz) | | | | 2 | | |
| 3 Marginal Waves (Rate on scale from 1=none to 9=many) | | | | 6 | | |
| 4 Longitudinal Creases (Rate on scale from 1=none to 9=many) | | | | 5 | | |
| 6. TASSEL: | | | | | | |
| 05 Number of Primary Lateral Branches | 2.0 | 45 | | 09 1.7 | 45 | |
| 035 Branch Angle from Central Spike | 18.6 | 45 | | 044 16.9 | 45 | |
| 34.7 Cm Tassel Length (from top leaf collar to tassel tip) | 1.3 | 45 | | 42.4 6.2 | 45 | |
| 6 Pollen Shed (Rate on scale from 0=male sterile to 9=heavy shed) | | | | 7 | | |
| 05 Anther Color (Munsell code 2.5GY 8/6) | | | | 05 (Munsell code 2.5GY 8/6) | | |
| 02 Glume Color (Munsell code 5GY 5/6) | | | | 05 (Munsell code 5GY 7/6) | | |
| 2 Bar Glumes (Glume Bands): 1=Absent 2=Present | | | | 2 | | |
| 7a. EAR (Unhusked Data): | | | | | | |
| 05 Silk Color (3 days after emergence) (Munsell code 2.5GY 8/8) | | | | 05* (Munsell code 2.5GY 8/8) | | |
| 05 Fresh Husk Color(25 days after 50% silking) (Munsell code 5 GY 7/6) | | | | 05 (Munsell code 5GY 7/6) | | |
| 22 Dry Husk Color (65 days after 50 % silking) (Munsell code 2.5Y 8/4) | | | | 22 (Munsell code 2.5Y 8/4) | | |
| 1 Position of Ear at Dry Husk Stage: 1=Upright 2=Horizontal 3=Pendent | | | | 1 | | |
| 6 Husk Tightness (Rate on scale from 1=very loose to 9=very tight) | | | | 6 | | |
| 2 Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium (<8cm) 3=Long (8-10 cm beyond ear tip) 4=Very long (>10 cm) | | | | 2 | | |
| 7b. EAR (Husked Ear Data): | Standard Deviation | Sample Size | | Standard Deviation | Sample Size | |
| 12.2 cm Ear Length | 0.7 | 45 | | 15.2 1.9 | 45 | |
| 37.3 mm Ear Diameter at mid-point | 1.7 | 45 | | 44.0 2.4 | 45 | |
| 085.4 gm Ear Weight | 8.0 | 45 | | 121.9 23.7 | 45 | |
| 15 Number of Kernel Rows | 1.1 | 45 | | 14 0.4 | 45 | |
| 2 Kernel Rows: 1=Indistinct 2=Distinct | | | | 2 | | |
| 2 Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral | | | | 2 | | |
| 7.1 cm Shank Length | 2.3 | 45 | | 10.8 0.7 | 40 | |
| 2 Ear Taper: 1=Slight 2=Average 3=Extreme | | | | 2 | | |
| Application Variety Data NP2391 | | | | Standard Inbred Data A619 | | |
| Note: Use chart on first page to choose color codes for color traits | | | | | | |

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| Applicant Variety Data NP2391 | | | | Page 3 | Standard Inbred Data A619 | | | |
|---|---|-----|----|--------------------|---------------------------|--------------------|----|-------------|
| 8. KERNEL (Dried): | | | | Standard Deviation | Sample Size | Standard Deviation | | Sample Size |
| 10.5 | mm Kernel Length | 0.6 | 45 | 10.7 | 0.7 | | 45 | |
| 08.0 | mm Kernel Width | 1.3 | 45 | 08.8 | 0.6 | | 45 | |
| 03.9 | mm Kernel Thickness | 0.2 | 45 | 03.7 | 0.7 | | 45 | |
| 14.6 | % Round Kernels (Shape Grade) | 4.7 | 40 | 30.3 | 24.8 | | 45 | |
| 1 | Aleurone Color Pattern: 1=Homozygous 2=Segregating | | | 1 | | | | |
| 19 | Aleurone Color (Munsell code 2.5Y 8/6) | | | 19 | (Munsell code 2.5Y 8/6) | | | |
| 06 | Hard Endosperm Color (Munsell code 2.5Y 8/8) | | | 06 | (Munsell code 2.5Y 8/8) | | | |
| 3 | Endosperm Type: 1=Sweet (su1) 2=Extra Sweet (sh2) 3=Normal Starch 4=High Amylose Starch 5=Waxy Starch 6=High Protein 7=High Lysine 8=Super Sweet (se) 9=High Oil 10=Other | | | 3 | | | | |
| 24.1 | gm Weight per 100 Kernels (unsized sample) | 4.1 | 45 | 28.6 | 2.8 | | 45 | |
| 9. COB | | | | Standard Deviation | Sample Size | Standard Deviation | | Sample Size |
| 22.2 | mm Cob Diameter at mid-point | 2.8 | 45 | 26.5 | 2.6 | | 45 | |
| 14 | Cob Color (Munsell code 5R 4/6) | | | 19 | (Munsell code 2.5Y 8/2) | | | |
| 10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant): leave blank if not tested: leave Race or Strain Options blank if polygenic): | | | | | | | | |
| A. Leaf Blights, Wilts, and Local Infection Diseases | | | | | | | | |
| Anthracnose Leaf Blight (<i>Colletotrichum graminicola</i>) | | | | | | | | |
| Common Rust (<i>Puccinia sorghi</i>) | | | | | | | | |
| Common Smut (<i>Ustilago maydis</i>) | | | | | | | | |
| 8 | Eyespot (<i>Kabatiella zeae</i>) | | | 7 | | | | |
| | Goss's Wilt (<i>Clavibacter michiganense</i> spp. <i>Nebraskense</i>) | | | | | | | |
| 6 | Gray Leaf Spot (<i>Cercospora zeae-maydis</i>) | | | | | | | |
| 9 | Helminthosporium Leaf Spot (<i>Bipolaris zeicola</i>) Race 3 | | | 6 | Race 3 | | | |
| 9 | Northern Leaf Blight (<i>Exserohilum turcicum</i>) Race Mixed | | | 6 | Race Mixed | | | |
| 6 | Southern Leaf Blight (<i>Bipolaris maydis</i>) Race O | | | | Race | | | |
| Southern Rust (<i>Puccinia polysora</i>) | | | | | | | | |
| Stewart's Wilt (<i>Erwinia stewartii</i>) | | | | | | | | |
| Other (Specify) | | | | | | | | |
| B. Systemic Diseases | | | | | | | | |
| Corn Lethal Necrosis (MCMV and MDMV) | | | | | | | | |
| Head Smut (<i>Sphacelotheca reiliana</i>) | | | | | | | | |
| Maize Chlorotic Dwarf Virus (MCDV) | | | | | | | | |
| Maize Chlorotic Mottle Virus (MCMV) | | | | | | | | |
| Maize Dwarf Mosaic Virus (MDMV) Strain | | | | Strain | | | | |
| Sorghum Downy Mildew of Corn (<i>Peronosclerospora sorghi</i>) | | | | | | | | |
| Other (Specify) | | | | | | | | |
| C. Stalk Rots | | | | | | | | |
| Anthracnose Stalk Rot (<i>Colletotrichum graminicola</i>) | | | | | | | | |
| Diplodia Stalk Rot (<i>Stenocarpella maydis</i>) | | | | | | | | |
| Fusarium Stalk Rot (<i>Fusarium moniliforme</i>) | | | | | | | | |
| Gibberella Stalk Rot (<i>Gibberella zeae</i>) | | | | | | | | |
| Other (Specify) | | | | | | | | |
| Ear and Kernel Rots | | | | | | | | |
| Aspergillus Ear and Kernel Rot (<i>Aspergillus flavus</i>) | | | | | | | | |
| Diplodia Ear Rot (<i>Stenocarpella maydis</i>) | | | | | | | | |
| Fusarium Ear and Kernel Rot (<i>Fusarium moniliforme</i>) | | | | | | | | |
| Gibberella Ear Rot (<i>Gibberella zeae</i>) | | | | | | | | |
| Other (Specify) | | | | | | | | |
| Application Variety Data NP2391 | | | | | Standard Inbred Data A619 | | | |
| Note: Use chart on first page to choose color codes for color traits | | | | | | | | |

| Applicant Variety Data NP2391 | | | Page 4 | Standard Inbred Data A619 | | | |
|--|---|---|--------|---------------------------|-------------|--------------------|-------------|
| 11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant): leave blank if not tested: Banks Grass Mite (<i>Oligonychus pratensis</i>) Corn Earworm Leaf-Feeding Silk-Feeding: mg larval wt. Ear Damage Corn Leaf Aphid (<i>Rhopalosiphum maidis</i>) Corn Sap Beetle (<i>Carpophilus dimidiatus</i>) European Corn Borer (<i>Osstrinia nubilalis</i>) 6 1 st Generation (Typically Whorl Leaf Feeding) 2 nd Generation (Typically Leaf Sheath-Collar feeding) Stalk Tunneling: cm tunneled /plant Fall Armyworm Leaf-Feeding Silk-Feeding: mg larval wt. Maize Weevil (<i>Sitophilus zeamaize</i>) Northern Rootworm (<i>Diabrotica barberi</i>) Southern Rootworm (<i>Diabrotica undecimpunctata</i>) Southwestern Corn Borer (<i>Diatraea grandiosella</i>) Leaf-Feeding Stalk Tunneling: cm tunneled/plant Twospotted Spider Mite (<i>Tetranychus urticae</i>) Western Rootworm (<i>Diabrotica virgifera virgifera</i>) | | | | Standard Deviation | Sample Size | Standard Deviation | Sample Size |
| | | | | | 5 | | |
| 12. AGRONOMIC TRAITS: | | | | | | | |
| NA | Stay Green (at 65 days after anthesis) (rate on scale from 1=worst to 9=excellent.) | | | | NA | | |
| 1 | % Dropped Ears (at 65 days after anthesis) | | | | 1 | | |
| 0 | % Pre-anthesis Brittle snapping | | | | 0 | | |
| 0 | % Pre-anthesis Root Lodging | | | | 2 | | |
| 0 | % Post-anthesis Root Lodging (at 65 days after anthesis) | | | | 1 | | |
| 3892.5 | Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture) | | | | 2061.0 | | |
| 13. MOLECULAR MARKERS: (0=data unavailable: 1 data available but not supplied: 2=data supplied) | | | | | | | |
| 1 | Isozymes | 2 | RFLP's | RAPD's | | | |
| REFERENCES: | | | | | | | |
| Butler, D.R. 1954. A System for the Classification of corn Inbred Lines. PhD thesis. Ohio State University. Emerson, R. A., G.W. Beadle, and A.C. Fraser. 1935. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180 Farr, D.F., G.F. Bills, G.P. Chamuris, A.Y. Rossman. 1989. Fungi on Plant and Plant Products in the United States. The American Phytopathological Society, St. Paul, MN. Inglett, G.E. (Ed) 1970. Corn: Culture, Processing, Products. Avi Publishing Company, Westport, CT. Jugenheimer, R.W. 1976. Corn: Improvement. Seed Production, and Uses. John Wiley & Sons, New York. McGee, D.C. 1988. Maize Diseases. AOS Press, St. Paul, MN. 150 pp. Munsell Color Chart for Plant Tissues. MCBETH. P.O. Box 230. Newburgh, N.Y. 12551-0230 The Mutants of Maize. 1968. Crop Science Society of America. Madison, WI. Shurtleff, M.C. 1980. Compendium of Corn Diseases. APS Press, St. Paul, MN. 105 pp. Sprague, G.F., and J.W. Dudley (Editors). 1988 Corn and Corn Improvement, Third Edition. Agronomy Monograph 18. ASA, SCCA, SSSA, Madison, WI. Stringfield, G.H, Maize Inbred Lines of Ohio. Ohio A.E.S., Bul. 831. 1959 U.S. Department of Agriculture. 1936, 1937. Yearbook. | | | | | | | |

COMMENTS (eg. state how heat units were calculated, standard inbred seed source, and /or where data was collected.

Continue in Exhibit D):

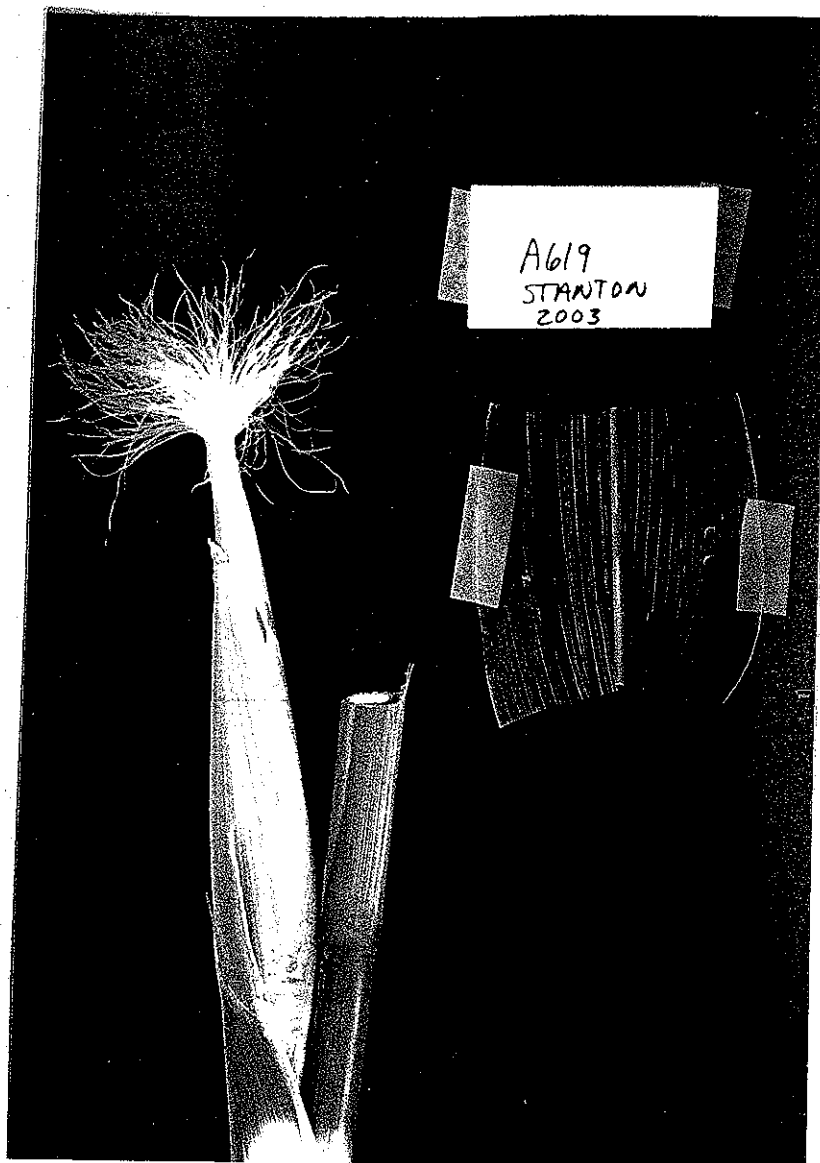
- 1) Heat Units per day were calculated using the standard formula: $HU = \{ \text{MaxTemp (86)} + \text{Min Temp (50)} \} / 2 - 50$.
- 2) Data for this exhibit was collected at London, Ontario, Canada, Stanton, MN and Janesville, WI.
- 3) Large standard deviations are probably due to environmental factors at each individual location where the variety was observed. Since the varieties reported in this exhibit are inbreds, the response to the environment is probably more pronounced than a hybrid or a combination of these inbred lines. Any stress at specific times during the growing season could influence results.
- 4) * - There is a slight pale purple shading of the silk ends on A619 with age.
- 5) Disease and Insect information for both inbred lines was collected at Stanton, MN in 2002.

The environmental data from London Ontario and for the Stanton Minnesota trials in the two years is being submitted. The environmental information for Janesville is not presently available.

10/28/07 SMS
The London trial location may be causing the standard deviations for these plants to be a bit wider than normal for a couple of reasons. The planting dates for the London trials were substantially later than the dates for the Stanton planting. London is in an area that plants 83-90 day corn and Stanton and Janesville are locations that plant 94-102 day corn. In addition to the relative maturity difference between the locations, the delayed plantings due to the weather conditions in London provide even less time for the plants to mature.

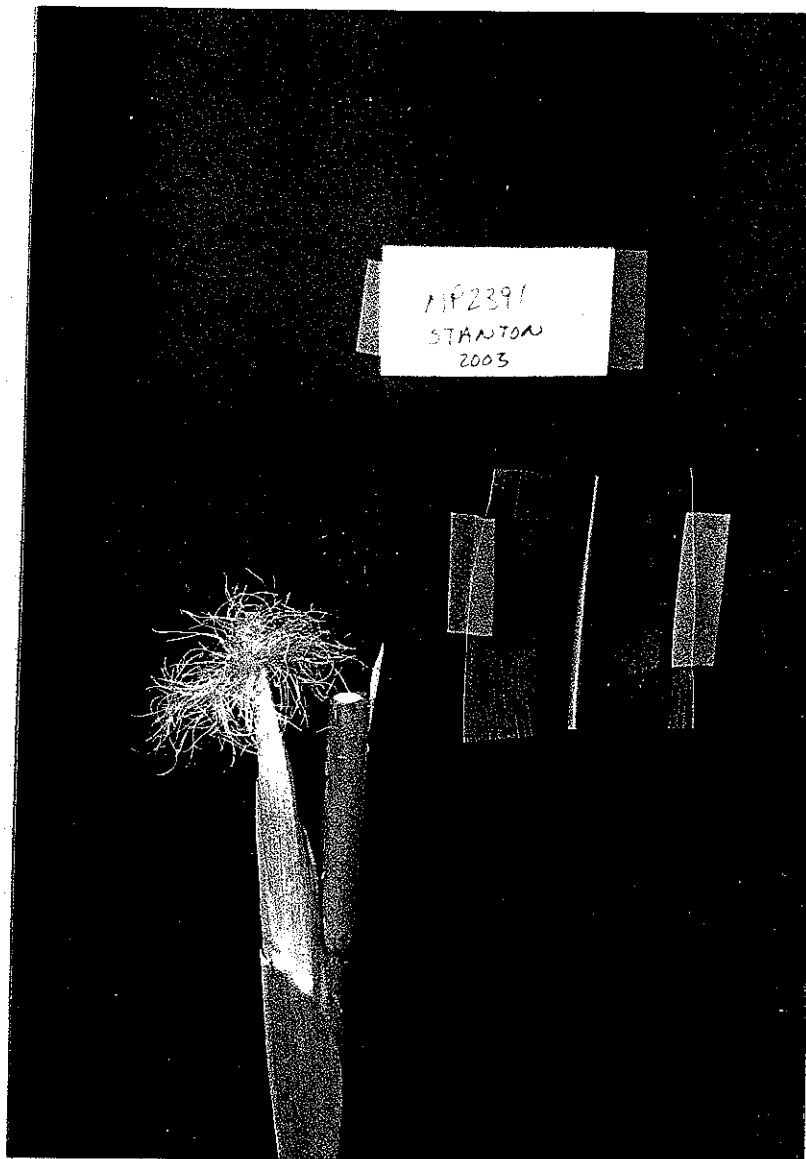
London normally plants in the May 5- May 10 range. But in both years the actual planting dates were substantially later than this date. The environment in 2003 was hotter than normal. To the extent that London trial resorted to nursery irrigation to attempt to avoid moisture stress at flowering time. In contrast, London had a very wet spring in 2004 which even further delayed the already late dates for planting.

Additional Description of the Corn Inbred Line NP2391
Table 1



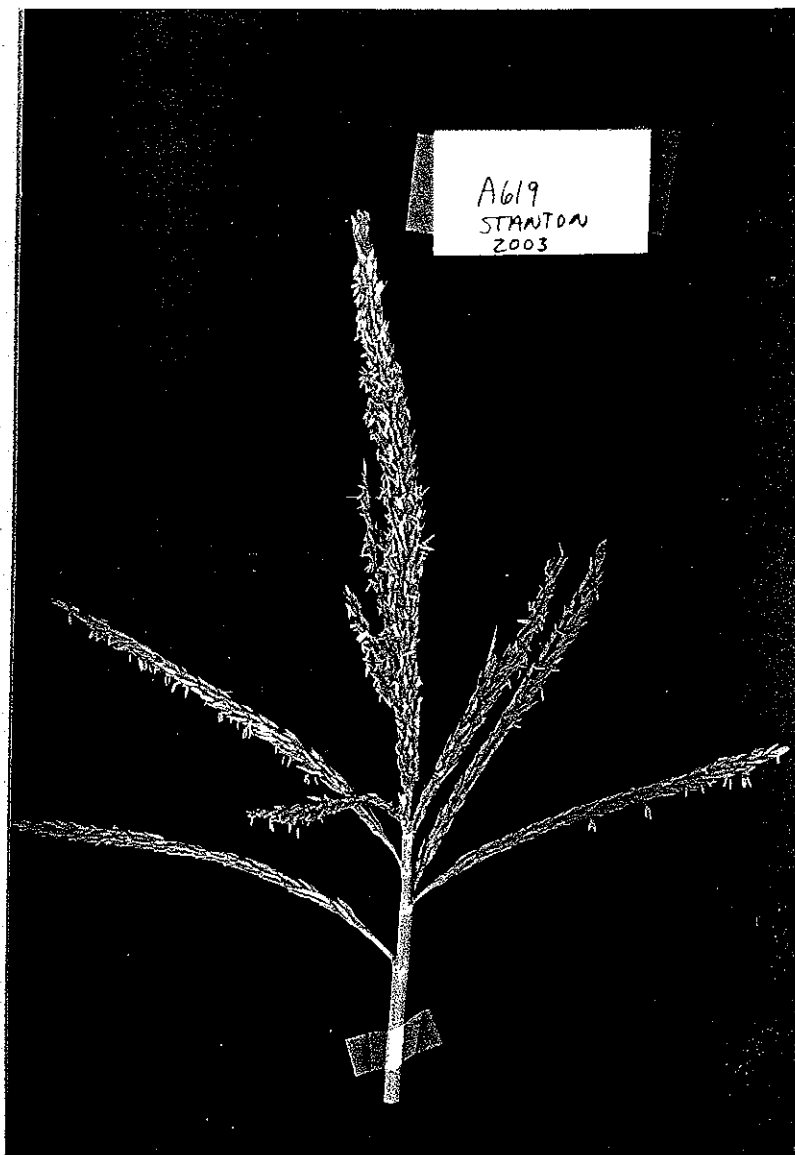
Typical A619 Silk and Second Leaf Color

Additional Description of the Corn Inbred Line NP2391
Table 1 (continued)



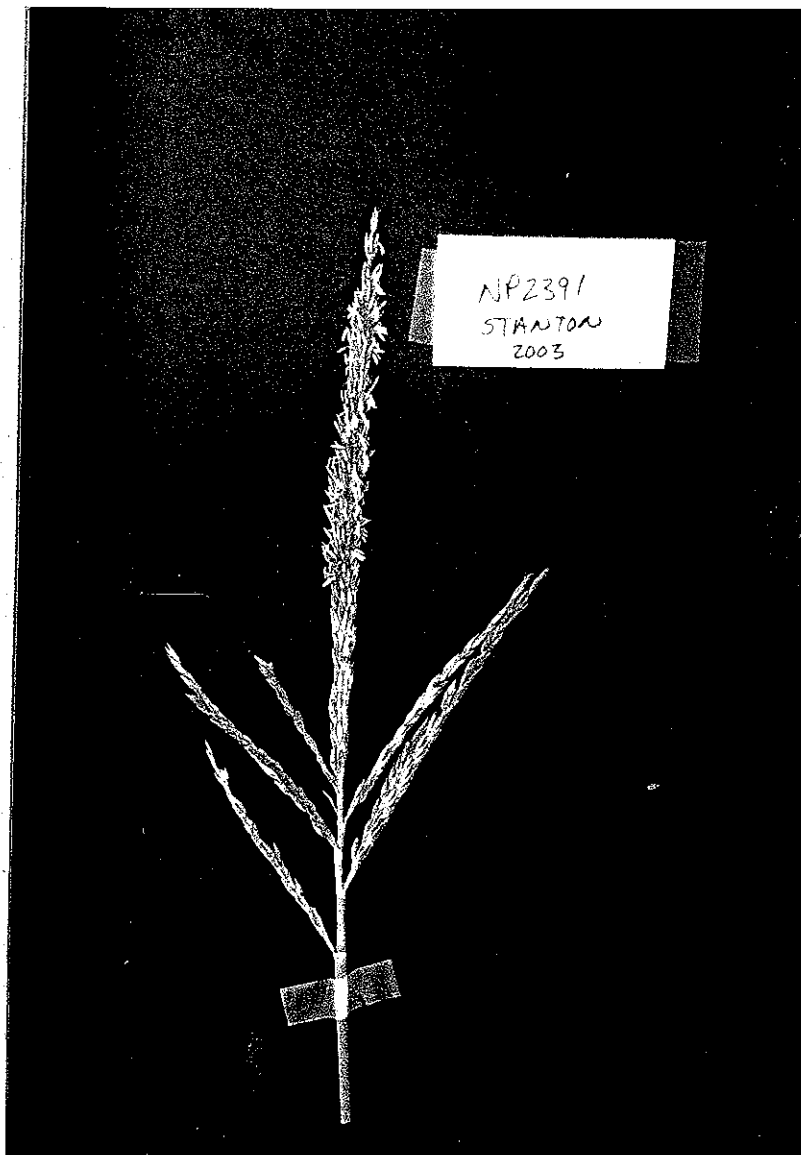
Typical NP2391 Silk and Second Leaf Color

Additional Description of the Corn Inbred Line NP2391
Table 2



Typical A619 Tassel

Additional Description of the Corn Inbred Line NP2391
Table 2 (continued)



Typical NP2391 Tassel

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

| | | |
|--|--|--|
| 1. NAME OF APPLICANT(S) Syngenta Seeds, Inc. | 2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER | 3. VARIETY NAME NP2391 |
| 4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) P.O. Box 959 Minneapolis, MN 55440 | 5. TELEPHONE (Include area code) (763) 593-7333 | 6. FAX (Include area code) (763) 593-7828 |
| 7. PVPO NUMBER | | 200400066 |

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain. ☒ YES ☐ NO9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country. ☒ YES ☐ NO10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES ☐ NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

(See attached Exhibit E Addendum)

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Syngenta Seeds, Inc.
NP2391
Exhibit E, Block #11

Additional Explanation on Ownership

Syngenta breeder, Brent Delzer, developed inbred NP2391, working primarily from Janesville, WI (see Exhibit A for detail). Delzer was a breeder for Northrup King Company at the beginning of the line's development, was employed by Novartis Seeds, Inc. (formed by the merger of Ciba Seeds and Sandoz Seeds) during the continued development of the line, and was employed by Syngenta Seeds, Inc. (formed by the merger of the agribusinesses of Novartis and Zeneca in 1999) at the completion of the line's development in 2000. This line is exclusively owned by Syngenta Seeds, Inc.